

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE <div style="text-align: center;">J</div>		PAGE OF PAGES <div style="text-align: center;">1 2</div>	
2. AMENDMENT/MODIFICATION NO. 0004		3. EFFECTIVE DATE 08-Apr-2002		4. REQUISITION/PURCHASE REQ. NO. W68MD9-1208-9973		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, SEATTLE ATTN: CENWS-CT P.O. BOX 3755 SEATTLE WA 98124-3755		CODE DACA67		7. ADMINISTERED BY (If other than item 6) <div style="text-align: center;">See Item 6</div>		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. DACA67-02-R-0202	
				X		9B. DATED (SEE ITEM 11) 08-Feb-2002	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>0</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A.THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B.THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C.THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D.OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) DESIGN-BUILD: VEHICLE MAINTENANCE FACILITIES, FORT LEWIS, WA - SEE ATTACHED ADDRESS TECHNICAL QUESTIONS TO: techbid@nws02.usace.army.mil							
<small>Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.</small>							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 08-Apr-2002	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

This amendment is issued to revise the solicitation as follows:

- A. Section 00010, Schedule, is revised to change line items 0007 and 0008.
- B. Section 00860, Statement of Work, Part II: para. 3.4.17, Plumbing, is revised.
- C. Appendix B, Conceptual Drawing: Drawing Sheets C-2, C-5, C-6, C-7, C-8, A-8 and A-9 are revised by notation to the drawings.
- D. The time and date for receipt of proposals are extended to 3:00 p.m., local time, on 19 April 2002.
- E. Offerors must acknowledge receipt of this amendment by number and date on the SF1442 BACK in block 19.

Enclosures:

Rev. Schedule

Rev. 00860

Rev. Appendix B

SCHEDULE

FY02 VEHICLE MAINTENANCE FACILITY
FT LEWIS, WASHINGTON
PN: 54068 & 54113

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Price</u>	<u>Amount</u>
BASE ITEMS					
0001	Provide all labor, professional services, materials, equipment and transportation necessary for the complete design (including professional oversight services during construction), of FY02 Vehicle Maintenance Facility at Fort Lewis, Washington, as described herein and as further required to provide for development in accordance with the Contractor's proposed design and construction schedule, except for Optional Items 0006 through 0008				
0001AA	Provide all labor, professional services, materials, equipment and transportation necessary for the complete design for FY02 Vehicle Maintenance Facility PN 54068 which includes the MARC, RSTA, and Engineering Company	1	JOB	L.S.	\$ _____
0001BB	Provide all labor, professional services, materials, equipment and transportation necessary for the complete design for FY02 Vehicle Maintenance Facility PN 54113 which includes the CSSC and Infantry BN	1	JOB	L.S.	\$ _____
0002	Provide all labor, material, equipment, and transportation necessary for the complete construction and equipping of FY02 Vehicle Maintenance Facility at Fort Lewis, Washington, including all related site work, utility work, and assembly and installation of Government furnished items, as described herein and as further required to provide for development in accordance with the Contractor's proposed design and construction schedule, except for Base Items 0003 through 0005 and Optional Items 0006 through 0008				
0002AA	FY02 Vehicle Maintenance Facility PN 54068 which includes the MARC, RSTA, and Engineering Company	1	JOB	L.S.	\$ _____

01003/RL
FY02 Vehicle Maintenance Facility, Fort Lewis

54068 & 54113

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
0002BB	FY02 Vehicle Maintenance Facility PN 54113 which includes the CSSC and Infantry BN	1	JOB	L.S.	\$ _____
0003	All Work for As-Built Drawings in Electronic Format as Specified, from Preparation to Final Submittal, for base bid and any option exercised				
0003AA	All Work for As-Built Drawings in Electronic Format for FY02 Vehicle Maintenance Facility PN 54068 which includes the MARC, RSTA, and Engineering Company	1	JOB	L.S.	\$12,500
0003BB	All Work for As-Built Drawings in Electronic Format for FY02 Vehicle Maintenance Facility PN 54113 which includes the CSSC and Infantry BN	1	JOB	L.S.	\$12,500
0004	All Work for O&M Manuals, as Specified, from Preparation to Final Submittal, for base bid and any option exercised				
0004AA	All Work for O&M Manuals for FY02 Vehicle Maintenance Facility PN 54068 which includes the MARC, RSTA, and Engineering Company	1	JOB	L.S.	\$30,000
0004BB	All Work for O&M Manuals for FY02 Vehicle Maintenance Facility PN 54113 which includes the CSSC and Infantry BN	1	JOB	L.S.	\$30,000
0005	All Work for 1354 Data/ Installed Equipment List, as Specified, from Preparation to Final Submittal, for base bid and any option exercised				
0005AA	All Work for 1354 Data/ Installed Equipment List for FY02 Vehicle Maintenance Facility PN 54068 which includes the MARC, RSTA, and Engineering Company	1	JOB	L.S.	\$6,000
0005BB	All Work for 1354 Data/ Installed Equipment List for FY02 Vehicle Maintenance Facility PN 54113 which includes the CSSC and Infantry BN	1	JOB	L.S.	\$6,000
TOTAL BASE ITEMS					\$ _____

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Price</u>	<u>Amount</u>
OPTIONAL ITEMS					
0006	Provide all labor, professional services, materials, equipment and transportation necessary for the complete design (including professional oversight services during construction) and construction of Sig Co.facility, as specified herein.	1	JOB	L.S.	\$ _____
0007	Provide all labor, professional services, materials, equipment and transportation necessary for the complete design (including professional oversight services during construction) and construction of MI Co. facility, <u>including parking for 32 vehicles</u> , as specified herein.	1	JOB	L.S.	\$ _____
0008	Provide all labor, professional services, materials, and equipment for MI Company vehicle parking for 32 vehicles <u>Provide all labor, professional services, materials, equipment and transportation necessary for the complete design (including professional oversight services during construction) and construction of Brigade HQ, including parking for 60 vehicles, as specified herein.</u>	1	JOB	L.S.	\$ _____
0009	Provide all labor, professional services, materials, and equipment for fifth bay at the RSTA Deployment Equipment Storage Building	1	JOB	L.S.	\$ _____
TOTAL OPTIONAL ITEMS					\$ _____
TOTAL BASE AND OPTIONAL ITEMS					\$ _____

NOTE: 1. The offeror shall not revise the dollar amounts established for Items 0003, 0004 and 0005.

2. No partial or total payment will be made for Items 0003, 0004 and 0005, until the as-built drawings, the O&M Manuals, and the 1354 Data/ Installed Equipment List are fully approved (A or B action).

ATTENTION:

TOTAL AMOUNT OF FUNDS AVAILABLE FOR DESIGN AND CONSTRUCTION IS \$16,922,000. THE GOVERNMENT MAY CHOOSE TO EXCEED THIS AMOUNT.

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SECTION 00860
STATEMENT OF WORK
PART II

3. DESIGN DEVELOPMENT TECHNICAL REQUIREMENTS

3.1 CIVIL DESIGN REQUIREMENTS

3.1.1 Civil design and construction shall be in accordance with the applicable requirements of paragraph 2. CODES AND STANDARDS and other requirements as stated herein.

3.1.2 Site Planning:

- (1) General. Contractor's operations shall at all times take into consideration that other facilities adjacent to the project must remain operational and be minimally impacted during the performance of the work. For additional information concerning coordination of work and access to the site see Section 01005 Site Specific Supplementary Requirements.
- (2) Site Plan. Plates C-4 and C-5 show the site plans, which is a preconcept design solution. Proposers are to develop the site design while meeting the criteria stated herein. Innovative, creative, and/or cost saving proposals, which fulfill these criteria, are encouraged and will be evaluated accordingly.

3.1.3 Site Design:

- (1) General Site Requirements. Overall site design shall conform to the guidance provided herein.
 - (a) The design shall present a consistent and unifying theme, tying together the various elements of the entire complex.
 - (b) The Contractor shall confine all proposed demolition and replacement operations to be within the project boundaries indicated on the attached drawings. Under no circumstances shall the Contractor perform any work off the site, except as authorized in the RFP or in writing by the Contracting Officer (CO). Required utility connections are an exception to this requirement.
 - (c) All survey control shall be based on the nearest Corps of Engineer's benchmarks. All existing survey monuments that are disturbed, lost or destroyed during demolition or construction shall be the responsibility of the Contractor and replaced in kind by a land surveyor registered in the State of Washington.
 - (d) Site design shall consider vehicular and pedestrian circulation, service vehicle, and vehicular parking as shown.
 - (e) All utility lines installed shall have a plastic marker tape (minimum 150 mm wide by .01 mm thick) installed as needed. The plastic marker tape shall include a metallic wire for detection purposes and shall bear a continuous printed inscription describing the type of utility line buried below. Utility line monument markers (concrete with brass identification plugs) shall be installed every 60 meters along straight runs and at each change of direction.

- (f) Protect existing utility lines when new pavements are constructed over them. Existing cover over utilities shall be maintained. If existing cover is not maintained over pipes, the pipe and/or cover shall be redesigned and constructed for HS-20 loading.
- (g) Site design (including landscaping) shall meet the Department of Defense Antiterrorism/Force Protection Standards.

(2) Storm Drainage/ Grading

- (a) Minimum grades for surface drainage shall conform to the guidance provided in the Geotechnical Report (see Appendix B). Provide adequate slope away from buildings to avoid ponding. Areas that cannot be adequately sloped shall have catch basins installed to drain water to a storm sewer system. Design and install storm sewer inlets and lines, as needed, to connect to the existing Ft. Lewis storm sewer system.
- (b) Surface runoff generated from construction of this facility and future work shall be retained on the project site, or removed by use of existing storm sewer line as indicated.
- (c) Catch basin grates shall be bicycle proof design.
- (d) Cut and fill material shall be balanced within the site as much as possible to minimize import and export of material.
- (e) Locate catch basins and grates so that no collection swales allow water to flow across a street or sidewalk to reach a storm sewer.
- (f) The downspouts shall be connected by new lines to the storm drain system.

(3) Water Distribution

- (a) Contractor shall provide looped water system for present construction. Existing water lines are shown on the drawings. It is the Contractor's responsibility to determine that water distribution lines are of adequate size to satisfy normal water demands for the facility, plus fire protection flow requirements. Water demand shall be in accordance with Mil Handbook 1008C, NFPA 13 (1999 Edition) and local standards and codes.
- (b) Water pressure and flow taken at the street hydrant at the intersection of East Drive and D Street is shown in the table below. The Contractor shall verify flow tests to determine that adequate pressures and flows are available. The Contractor shall design and construct water supply lines to meet project requirements.

Flow test taken by Ft Lewis Fire Dept 3/27/00			
		Pressure	
Hydrant Location	Pipe Size (inches)	Static (psi)	Residual (psi) @ Flow (gpm)
East Drive & D Street	8	78	60 @ 1,300

- (c) The Contractor's worst-case test results shall be used to design the fire protection system. The design should include additional consideration for concurrent demands

on main line water resources for adjacent property irrigation during the summer months.

- (d) Curb stops shall be provided for all water service lines. Service boxes shall be provided for all curb stops and shall extend to finished grade. The facility shall be provided with an interior service main cutoff-valve. Service lines shall be protected from freezing.

(4) Sanitary Sewer

- (a) Sanitary sewer design, construction and leakage testing shall conform to the National Standard Plumbing Code published by NAPHCC. Pipe materials and joints shall conform to the applicable ASTM, ANSI or other Standard as appropriate.
- (b) The Contractor shall design and construct new pipes and required appurtenances to connect to the existing system.
- (c) Manholes shall be placed at all angles and intersections. All sanitary sewers shall have straight alignment between manholes.
- (d) The Contractor shall coordinate all work on existing sanitary sewer lines with the CO.
- (e) Design new lines for a minimum of 0.6 meter per second for average flow.
- (f) Manhole covers located in pavements shall be designed for HS-20 design loading.
- (g) A duplex pump lift station shall be provided to pump effluent from the infantry battalion buildings (new and future) to discharge into the existing sanitary sewer in East Drive.

(5) Natural Gas Distribution

The buildings shall use natural gas-fired equipment for space heating. Contact person for the gas company (Puget Sound Energy) is Cheryl Papas at (253) 476-6315. The Contractor shall contract Puget Sound Energy Services to design, install and own meter set assemblies and underground natural gas piping to the buildings. The Contractor shall provide the gas piping system from the point of delivery, defined as the outlet of the meter set assembly as provided by Puget Sound Energy Services. For bidding purposes, the Contractor shall assume a value of \$100,000 for services supplied by Puget Sound Energy Services. The Government shall reimburse the Contractor for Puget Sound Energy Services in excess of the specified amount. The Contractor shall reimburse the Government if Puget Sound Energy Services are less than the specified amount.

(6) Propane Distribution

The Contractor shall provide piping (separate from the natural gas piping to be installed by PSE) as indicated on the drawings (see civil drawings). Isolation valves shall be provided to permit manual connection of the propane system to the building natural gas system. The propane piping shall tee into the natural gas piping between the natural gas meter and prior to entering the building.

(7) Parking

Reference TI 804-11 "POV Site Circulation and Parking" and the following:

- (a) Plate C-4 and Plate C-5 are representative of the general requirements for parking lot access and the proposer is responsible to develop the plan and incorporate the requirements stated herein.
- (b) Pavements for parking areas and access roads shall be asphaltic concrete and are to be in accordance with the requirements specified in the Geotechnical Report.
- (c) Roads and parking areas shall have gradients of a maximum 5 percent and a minimum of 1 percent. Grade to avoid ponding.
- (d) Curbs of portland cement concrete shall be provided at all pavements and shall comply with the curb design details provided in Ft. Lewis Engineering Standards.
- (e) Pavement markings shall conform to outline specification 02763 and the following: All passenger vehicle parking areas shall be marked with single 100 mm parking stripes. Handicapped painted symbols and signage will be required at all barrier-free parking spaces.
- (f) Design Vehicle: The light armored vehicle was selected for parking lot design. The vehicle is 6.93 meters long, 2.66 meters wide, and weighs 16,300 kilograms.
- (g) Pavement Design: Design of pavements shall be based on evaluation of existing conditions, anticipated loadings over the service life, and other relevant requirements. Minimum requirements for perimeter road is H-20 loading.
- (h) Handicapped stalls and access to buildings shall be as per Americans with Disabilities Act (ADA) guidance. Handicapped parking and access illumination shall be 50 lux average.
- (i) Landscape in parking areas. Landscaping shall be provided in the parking areas as indicated on the site plan. Existing trees shall be preserved where possible, as indicated on the site plan. For additional landscape requirements, see Para. 3.1.4.

(8) Soil Compaction.

Soil compaction shall be achieved with equipment suited to the particular soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the compaction specified with the equipment used. Each layer of material shall be compacted to not less than the percentage of maximum density specified in the Geotechnical Report.

3.1.4 Landscape Design and installation

(1) General.

A complete, integrated landscape planting plan shall be developed by a registered landscape architect, familiar with local conditions and plant species, and experienced in site planning and planting design. The designer shall insure that sound design principles for selecting and locating plant materials are employed to enhance the character of the site by enhancing the streetscape, lessening the visual impacts of parking and other less desirable areas, and blending with the landscape theme presented in the North Fort area. Landscape design and installation shall follow the guidance provided in Section 00860 Part 1, Para. 2.2.3.

(2) Landscape Design Objectives

- (a) Enhancing the streetscape along East Drive.
- (b) Provide native planting along North Gate Road.
- (c) Providing erosion control and site stabilization. No landscaping shall be provided inside of the perimeter or security fences, except for around the retention pond area. All areas disturbed due to Contractor activities, such as staging and storage areas, shall be restored to existing conditions at Contractor's expense. Grass areas shall be restored and seeded in accordance with specification section 02921.

(3) Planting

Streetscape planting along major roads and POV parking shall be provided as generally indicated on the concept site plans. Landscaping, including topsoil, grass seeding, and native planting shall be provided outside of the perimeter or security fences to provide erosion control/restoration of disturbed areas, roadside ditches, and swales and to blend to surrounding natural areas. Native planting other than grasses shall be provided where seeding is not determined to be sufficient for soil stabilization. Planting at the intersection of East Drive and Northgate Road shall be designed for safe sight distances by vehicles.

- (a) Existing trees and significant vegetation shall be preserved and protected where feasible. Existing vegetation to be preserved shall be as indicated on the conceptual site plan.
- (b) New landscaping shall meet all anti-terrorism and force-protection criteria. New landscaping shall also integrate sustainable principles into the design and construction of the project. Plant material selection shall include primarily natives and ornamentals that are drought-tolerant once established and require no chemical treatment on a regular basis.
- (c) New trees shall not be installed within 6M of any new or existing underground utility lines.

(4) Topsoil and Grass Seeding.

All disturbed areas within the clearing and grubbing limits and outside paved, rock-mulched, or developed areas of the project shall receive topsoil and be seeded to low-maintenance field/native grass mixes as recommended in the Fort Lewis design standards. Topsoil shall be stripped from existing landscaped areas prior to construction activities, then screened and amended, as required, for reuse in new landscaped areas. If stripped material is not sufficient, the CONTRACTOR shall obtain additional topsoil from off-site. Excess topsoil shall be disposed of on-site as directed by the Contracting Officer Representative. Topsoil shall be spread over prepared sub-grades to a minimum compacted depth of 100mm. Finished grades shall be hydroseeded and mulched. A 3-month minimum maintenance period will be required to ensure a satisfactory stand of turf. Heavily compacted soils or sterile gravels found within the areas to receive new landscaping shall be removed to a minimum depth of 300 mm and replaced with satisfactory fill to match adjacent elevations and avoid depressions prior to placing topsoil and seeding. Areas seeded to field/native grasses shall not require a permanent irrigation system.

(5) Streetscape and POV Parking Area.

Street trees shall be planted between East Drive and the Vehicle Maintenance Facility and in the proposed POV parking area. Existing trees located along East Drive shall be

preserved , where possible. An automatic underground irrigation system shall be provided for all parking lot, street tree, and streetscape plantings, including turf areas between East Drive and the POV parking area. An exterior irrigation controller shall be provided in the location as indicated approximately on the drawings.

(6) Native Planting along North Gate Road.

Native planting consisting primarily of shrubs and groundcovers shall be provided along North Gate Road as indicated on the drawings. Minimal trees shall be provided within the native planting area for scale and visual variety. Trees, shrubs, and groundcovers shall be native or indigenous and shall be selected for drought-tolerance and low-maintenance, as well as aesthetics. Irrigation for the native plantings shall consist of a drip system to aid in the establishment of the plantings during the first two to three seasons.

(7) Landscape Irrigation Systems.

An automatic underground irrigation system shall be provided for all new plantings (trees, shrubs, and groundcovers) provided within the project site, excluding turf areas. Irrigation systems shall be designed by a landscape architect, certified irrigation designer, or engineer with a minimum of two years experience in similar irrigation design projects. The irrigation systems shall utilize potable water and be well coordinated with other utilities. All irrigation systems shall have proper backflow prevention devices at the point of connection to the domestic water system and be in compliance with local codes. Irrigation systems shall be designed for water conservation and ease of maintenance by operation and maintenance personnel.

3.2 ARCHITECTURAL REQUIREMENTS

3.2.1 Design Criteria

The architectural design of the Tactical Equipment Maintenance Buildings (TEMB) (designated CSSC, MARC, RSTA and IB) shall be modified versions of the Department of the Army Standard Design for Tactical Equipment Maintenance Facilities with varying degrees of customization. The RFP schematic designs show the following composite types:

- (a) CSSC: "Building 3" Repair and Scheduled Maintenance Bays with "Building 2" Administrative Core (with increased size in "Communications" and "Break, Training and Conference" rooms).
- (b) MARC: "Building 3" Repair and Scheduled Maintenance Bays with "Building 1" Administrative Core (with "General Item Repair" and combination "Weapons and Comsec Vault" rooms deleted, space absorbed by "Break, Training and Conference" room.)
- (c) RSTA and IB: "Building 1" (with one Bay deleted and the Administrative Core redesigned to accommodate four (4) combination "Weapons and Comsec Vaults" at the IB building and five (5) combination vaults at the RSTA building.

Proposals shall adhere to the requirements of the Standard Design, except as revised or expanded by the criteria identified in this RFP.

Associated with the TEMB's are various sizes of Deployment Equipment Storage Buildings (DESB). The RFP schematic designs for these structures are based on generic, pre-engineered metal building typologies. Army Standard Designs do not exist for these structures.

In addition to the criteria listed in the Standard Design and this RFP, proposed designs shall comply with the International Building Code (IBC) 2000 edition, the National Fire Protection

Association (NFPA) Life Safety Code, 2000 edition, and the Military Handbook "Fire Protection for Facilities Engineering, Design and Construction", MIL-HDBK-1008C. Where conflicts exist, the most conservative requirements shall govern.

3.2.2 Functional Description

Intended to serve the organizational maintenance needs of the Interim Brigade Combat Team (IBCT), these facilities will be used to service and repair tactical wheeled vehicles. Military personnel will work in the CSSC, RSTA, and IB buildings. Civilian personnel employed by a civilian contractor will staff the MARC. A standard design Administrative Core module shall occupy one end of each facility, with combinations of Scheduled Maintenance and Repair Bays extending away from the core. All service bays are single story spaces with sufficient height to accommodate an overhead bridge crane, building service mechanical equipment and bay lighting.

(1) Typical functions

- (a) CSSC functions include vehicle inspection, preventative maintenance, limited diagnostic analysis, some welding and spot painting, light body work, repair of direct exchange modules, replacement or repair of direct exchange systems, major component repair, and transfer of end items to direct support maintenance. Facility functional spaces include open bays served by a 10 metric ton capacity bridge crane (repair bays) and a 5 metric ton capacity bridge crane (maintenance bays), bay support, administration, shop control, storage, tool room, parts room, weapons vault, comsec vault, latrines with shower and locker areas, a break/training/conference room, janitor closet, and building support mechanical, electrical, and communications spaces.
- (b) The MARC will be used for scheduled maintenance activities such as fluid changes, lubrication and limited parts replacement. Facility functional spaces include open bays served by a 10 metric ton bridge crane (repair bays) and a 5 metric ton capacity bridge crane (maintenance bays), administration, storage, tool room, parts room, latrines with shower and locker areas, a break/training/conference room, janitor closet, and building support mechanical, electrical, and communications spaces.
- (c) RSTA and IB facilities will be used only for daily vehicle inspections and fluid top off. Facility functional spaces include a single open bay (without bridge cranes), administration, storage, multiple combined weapons and comsec vaults, latrines, janitor closet, and building support mechanical, electrical, and communications spaces.
- (d) DESB buildings provide weather protection for basic storage of materials. These facilities are unheated and not insulated. Access is by personnel only; there are no operational requirements for forklift or vehicle access into these structures. DESB structures are subdivided with partitions of chain link fencing to provide segregated, secured storage for each unit. DESB facilities also feature a raised curb at the perimeter of the floor slab to reduce the intrusion of surface water.

(2) Gross floor areas

CSSC, MARC, RSTA, and IB gross floor areas vary because of the different occupancies and operations in each building. The RFP schematic designs indicate approximate gross areas of 1 948 square meters for the CSSC, 1 723 square meters in the MARC, 642 square meters in the RSTA and 597 square meters in the IB. The design shall provide a distribution of space and equipment as described in this RFP (see Space Requirements tabulation at paragraph 3.2.3) and delineated in the Standard Design. A significant change

to the Standard design at CSSC and MARC is the elimination of the Warehouse modules. A fluid storage room has also been added to the CSSC and MARC to accommodate fluid dispensing and recycling requirements.

The RSTA and IB buildings are significantly altered from the standard design due to the deletion of a repair bay and reconfiguration of the administrative area to accommodate multiple combined weapon and comsec vaults (5 at RSTA, 4 at IB).

Gross floor areas of the DESB structures range from 162 square meters to 488 square meters with a total floor area required at this facility of approximately 2 012 square meters.

3.2.3 Space Requirements

(1) Definitions

Net Areas: the clear area measured to the inside face of the room walls available for freestanding furniture, tables, and equipment.

Gross Building Area: the entire plan area of each floor measured from the outside edges of exterior walls. Include all walls, shafts and open areas (such as stairs). Also include any covered, but not enclosed exterior areas, such as covered entrances with floor area counted at 50% of actual area. Cantilevered roof overhangs are not included.

(2) Tables

Design standards for the TEMB include requirements for both net and gross areas. Tables 1 through 5 identify the specific area requirements for this project. See tables on following pages.

Table 1: CSSC Space Requirements		
Functional Area	RFP Schematic Net Area (sf)	RFP Schematic Net Area (m ²)
Repair Bays (total of 3)	6,196.55 sf	575.62 m ²
Scheduled Maintenance Bays (total of 3)	6,196.55 sf	575.62 m ²
Circulation Bays (total of 2)	968.42 sf	89.96 m ²
Fluid Storage	1,088.99 sf	101.16 m ²
General Item Repair	394.32 sf	36.63 m ²
Compact Item	251.15 sf	23.33 m ²
Prescribed Load List (PLL) Storage	147.27 sf	13.68 m ²
Repairable Exchange and Technical Supply (RX/TS) Storage	228.65 sf	21.24 m ²
Tool Room	118.63 sf	11.02 m ²
Tool Box Storage	43.71 sf	4.06 m ²
Comsec Vault	253.62 sf	23.56 m ²
Weapons Vault	253.62 sf	23.56 m ²
Men's Latrine & Locker Room	608.98 sf	56.57 m ²
Women's Latrine & Locker Room	198.08 sf	18.40 m ²
Mechanical Room	475.81 sf	44.20 m ²
Electrical Room	111.96 sf	10.40 m ²
Communications Room	116.26 sf	10.80 m ²
Janitor Closet	33.59 sf	3.12 m ²
Corridor	874.44 sf	81.23 m ²
Break/Training/Conference Room	422.42 sf	39.24 m ²
Storage	73.63 sf	6.84m ²
Administration	503.80 sf	46.80 m ²
Total Net Floor Area	19,560.33 sf	1,817.03 m ²
Gross Building Area	20,964.84 sf	1,947.50 m ²

Table 2: MARC Space Requirements		
Functional Area	RFP Schematic Net Area (sf)	RFP Schematic Net Area (m ²)
Repair Bays (total of 3)	6,196.55 sf	575.62 m ²
Scheduled Maintenance Bays (total of 3)	6,196.55 sf	575.62 m ²
Circulation Bays (total of 2)	968.42 sf	89.96 m ²
Fluid Storage	1,088.99 sf	101.16 m ²
Prescribed Load List (PLL) and Repairable Exchange and Technical Supply (RX/TS) Storage	296.47 sf	27.54 m ²
Tool Room	69.76 sf	6.48 m ²
Tool Box Storage	69.76 sf	6.48 m ²
Men's Latrine & Locker Room	248.78 sf	23.11 m ²
Women's Latrine & Locker Room	224.34 sf	20.84 m ²
Mechanical Room	265.25 sf	24.64 m ²
Electrical Room	92.36 sf	8.58 m ²
Communications Room	58.78 sf	5.46 m ²
Janitor Closet	20.67 sf	1.92 m ²
Corridor	667.32 sf	61.99 m ²
Break/Training/Conference Room	682.07 sf	63.36 m ²
Administration	287.21 sf	26.68 m ²
Total Net Floor Area	17,433.27 sf	1,619.44 m ²
Gross Building Area	18,548.53 sf	1,723.20m ²

Table 3: RSTA and IB Space Requirements (areas are indicated for one building - two are required)		
Functional Area	RFP Schematic Net Area (sf)	RFP Schematic Net Area (m ²)
Scheduled Maintenance Bay	2,064.19 sf	191.75 m ²
Circulation Bay	462.90 sf	43.00 m ²
Storage	299.70 sf	27.84 m ²
Weapons and Comsec Vaults (total of 4)	1,119.56 sf	104.00 m ²
Men's Latrine & Locker Room	179.78 sf	16.70 m ²
Women's Latrine & Locker Room	148.34 sf	13.78 m ²
Mechanical Room	226.82 sf	21.07 m ²
Electrical Room	74.28 sf	6.90 m ²
Communications Room	58.78 sf	5.46 m ²
Janitor Closet	20.67 sf	1.92 m ²
Corridor	792.09 sf	73.58 m ²
Administration	287.21 sf	26.68 m ²
Total Net Floor Area (IB)	5,734.30 sf	532.68 m ²
Gross Building Area (IB)	6,426.70 sf	597.00 m ²
Weapons and Comsec Vaults (1 add'l at RSTA)	279.89 sf	26.00 m ²
Corridor (additional area at RSTA)	159.21 sf	14.79 m ²
Total Net Floor Area (RSTA)	6173.40 sf	573.47 m ²
Gross Building Area (RSTA)	6,911.13 sf	642.00 m ²

Table 4: DESB Space Requirements (Total of 7 buildings required)		
Facility Supported	RFP Schematic Net Area (sf)	RFP Schematic Net Area (m ²)
CSSC, Engineer, Signal and Military Intelligence Companies (1 building each unit)	(each) 1743.93 sf	(each) 162.0 m ²
Brigade HHC	4521.30 sf	420.0 m ²
Infantry Battalion	4908.84 sf	456.0 m ²
RSTA	5253.32 sf	488.0 m ²
Gross Area (all buildings)	21,659.18 sf	2,012.0 m ²
RSTA optional fifth bay	1313.33 sf	122.00 m ²
Gross Area (all buildings + option)	22,972.51 sf	2,134.00 m ²

3.2.4 Specific Functional Area Requirements

Basic descriptions of the various functional areas contained in the TEMB's are outlined below. Due to the variety of operational requirements, some of the listed areas are not included in every building. Room sizes and configurations also vary between buildings. Refer to the space tabulations in this section and the various drawings included with this RFP for specific definition of building/room adjustments.

(1) Repair Bays

Repair bays will be used for the repair and servicing of wheeled vehicles, construction equipment and large power generation equipment. All bays are configured to provide for drive through accessibility, with overhead coiling doors at both ends of the bay. Bays are sized to permit simultaneous occupancy by up to four vehicles. A continuous, grated, trench drain shall be installed inside all overhead doors. All repair bays in the CSSC and MARC shall be served by a single, trolley type, underslung bridge crane with 10 metric tons capacity. This is an increase from the standard design crane capacity of 5 metric tons. No crane is required in the RSTA and IB buildings. To eliminate the build up of vehicle exhaust, a dedicated exhaust removal system shall be provided with a coiling exhaust pipe connection on each side of every bay (see drawing A-8). Floor slopes in repair bays shall be consistent with the use of mobile, independent hydraulic lifts.

(2) Scheduled Maintenance Bays

All components required of the Repair Bays (except for crane size) shall also be provided for the Scheduled Maintenance Bays. The Maintenance Bays shall be served by a 5 metric ton bridge crane. This crane shall be separate and independent of the Repair Bays crane. The 10 and 5 ton cranes shall access and service only their respective areas of the building. At the end wall Scheduled Maintenance Bay, provide sloped floors with floor drains to collect wastewater from limited engine or vehicle cleaning operations. General

vehicle washing will not be performed at this location. A combined emergency shower and eyewash station shall also be included in the end bay immediately adjacent to end wall of the building. Floor slopes in maintenance bays shall be consistent with the use of mobile, independent hydraulic lifts.

(3) Circulation Bays

Circulation Bays shall be included to provide code required defined paths of egress from the maintenance, service and repair functional areas. No required path of egress from the administrative core portion of any facility shall be routed through a Circulation Bay. The exit and circulation bay locations indicated on the RFP drawings shall be maintained. Primary function of these spaces is to create a pathway clear of vehicles, tools and equipment. A combined emergency shower and eyewash station shall be included in the circulation bay immediately adjacent to the administrative core.

(4) Administration

This space shall provide an open office work area for foremen, production control, and clerical personnel. Each occupant is allotted approximately 8 square meters for personal workstation, with an additional 4 square meters for circulation. The number of modular workstations varies with the function and occupancy of each building. The Administration area shall have a viewing window to the service bays. This space shall be fully enclosed and capable of being secured from the rest of the building.

(5) Compact Item Repair

The area for compact item repair provides for the organizational maintenance of radios, telephones, small switchboards and personal computers. The area shall accommodate three GFCI work benches with associated storage equipment. A full height wire mesh partition shall subdivide the room shared with General Item Repair.

(6) General Repair

Space is provided for repair of fabric, small generators, fuel and electrical systems, quartermaster and chemical equipment such as mess kits, gas masks, heaters, laundry machines, bakeries, smoke generators, liquid dispensing equipment and decontamination equipment. The area shall accommodate three GFCI work benches with associated storage equipment. General Repair shall be co-located with Compact Item Repair, yet separately accessed and secured.

(7) Tool Room

The tool room shall be designed for issue and secure storage of common tool kits shared by shop personnel. This area is co-located with Tool Box Storage described below, but is separated by wire mesh partitions so that it can be secured separately. One person, a "tool keeper," will occupy the room.

(8) Tool Box Storage

Tool Box Storage provides for issue and secure storage of tool kits used by personnel working inside and outside (contact teams) the shop. Access to the Tool Box is by a personnel door separate from the Tool Room.

(9) Repairable Exchange and Technical Supply (RX/TS)

This area is utilized for the temporary storage of items and components that do not function, but are repairable and will be exchanged for new items. Another function is the storage of parts ordered on an as-needed basis from the supporting DS activity. The

RX/TS area includes a GFCI component exchange (RX) counter with racks, shelves, and floor area for the turn-in and issue of repairable items through the repairable exchange process. Shelving or cabinetry (also GFCI) will support other storage requirements of technical supply (TS). In the CSSC, the RX/TS is co-located with the PLL, yet separated by a wire mesh partition to maintain distinct access and security. In the MARC, RSTA and IB buildings the RX/TS and PLL share a common location.

(10) Prescribed Load List (PLL) Storage

Space is provided for storage of prescribed load list (PLL) items, which are parts kept in stock at all times because of demand supporting their inventory or management decisions by maintenance personnel. The PLL area is primarily for storage of shop stock for organizational maintenance. In the RSTA and IB buildings the area functions as a miscellaneous storage room.

(11) Latrines, Showers, and Lockers

Latrine facilities in the CSSC and MARC shall be designed consistent with the modified standard design layouts as indicated in the drawings. The latrines in the RSTA and IB buildings have been modified to delete the shower and locker areas that are unnecessary in these buildings. For design purposes the ratio of male to female occupants is established as 9 to 1.

(12) Janitor Closet

Janitor closets shall provide space for janitorial equipment and supplies as well as general building storage. Mop sink, mop holders, and shelving units shall be supplied for maintenance and general cleaning of the facility.

(13) Break/Training/Conference Area (BTC)

This multi-purpose area is utilized for work breaks, training and conferences. The primary purpose is for meal and break preparation and seating. To support that function the room shall include a unit kitchen or built in cabinetry and appliances. Appliances shall include a refrigerator (GFCI), a microwave oven (GFCI), and a sink. If sufficient wall space is available a range shall also be incorporated. Dedicated space for one (soft drink) vending machine (NIC) is preferred, but not required. Configuration of this room must also provide sufficient flexibility for easy conversion to a training or meeting area.

(14) Weapons and Comsec Vaults

These areas provide for the secure storage of weapons and/or communications equipment. The vaults may also be used for storage of other types of equipment requiring special security measures, such as cryptographic gear. Special storage racks (GFGI) and intrusion systems are required for this area. Storage racks are secured to cast-in-place wall anchors integrated into the initial construction. A dual door system is utilized with a vault door swinging into the corridor and a security "day gate" door swinging into the vault. Vault doors shall open against corridor walls (180 degree arc) to avoid blocking the egress path.

Vault construction shall be consistent with DOD 5200.1-R and Mil Handbook 1013 1A requirements for a Class "A" Vault. All walls, the floor and ceiling shall be constructed of 200-mm thick reinforced concrete. The vault door shall meet Federal Specification AA-D-00600C for "Class 5" construction. In-swinging, "day gate" door shall be fabricated with a steel frame and wire mesh panel construction. Provide cast-in-place anchor points as indicated on the drawings and coordinated with users. The contractor shall construct all vaults to pass the DOD certification inspection and obtain certification.

(15) Building Utility and Circulation Spaces

This non-assignable area accounts for space taken up by such elements as structural columns, walls, chases and common corridors. Utility space shall be provided for mechanical, electrical, and communications equipment, and other miscellaneous equipment and functions. The mechanical room shall support all equipment required for building heating, ventilation and domestic hot water, except air handling units, infrared heaters, and unit heaters. An electrical room shall be included for entrance and distribution panels. All telephone and local area network equipment shall be located in a communications room. The mechanical and electrical rooms shall be accessed only from the exterior of the building. Facility designs shall be configured to minimize corridors.

(16) Fluid Storage

Space dedicated to storage tanks for various fluids required to maintain vehicles, including motor oil, gear oil, hydraulic fluid, transmission fluid and anti-freeze. Tank storage of fluids shall be segregated between supply and waste/recycle. Supply fluids are pumped from tanks through fixed piping to hose reels mounted on the exterior walls of maintenance and repair bays. Waste fluids are extracted from vehicles and manually transferred to holding tanks. Space shall also be provided for the location of two air compressors serving the facility. All tanks and compressors shall be mounted on concrete housekeeping pads. Provide passive and active ventilation as required by NFPA and IBC codes for storage areas with the volume of flammable liquids indicated.

3.2.5 Government Furnished Items

The Government will furnish the items of equipment and furnishings as itemized below. All items listed below will be delivered to the Contractor for assembly and installation. The Contractor is responsible for protection and installation of all items as specified into the completed facility. Installation shall be after the pre-final inspection discrepancies have been corrected and prior to the final inspection. For Contractor's planning, the items will be available at a location within one half mile from the construction site no later than 30 days prior to the pre-final inspection. The final inspection will not occur until all items are installed in place. Minor changes to this list may be made by the Government to accommodate availability of items. When the Government furnished items are delivered, the Contractor shall verify the quantity and condition and acknowledge receipt in writing to the CO. The Contractor shall also report in writing to the CO within 24 hours of delivery any damage to or shortage of the property as received.

The following items shall be Government Furnished and Contractor Installed (GFCI):

<u>Item</u>	<u>Quantity</u>
tire changing machines and cages	2
portable steam cleaner	2
workbenches	11
office workstations	11
refrigerators	2
microwave ovens	2

3.2.6 Architectural Design

(1) Floor Plan.

All plan drawings provide conceptual representations of buildings consistent with army standard designs and as established through coordination meetings with Fort Lewis Interim Brigade and Department of Public Works representatives, and the Seattle District Corps of Engineers. The floor plans have been designed to serve the programmatic requirements established during a Design Charrette and subsequent programming meetings held at Fort Lewis. It is the Contractor's responsibility to ensure that the final design is in compliance with all regulatory agencies. Variations from the floor plans and areas indicated will not be allowed without prior approval by the COE PM. The mechanical, electrical and communication rooms have been preliminarily sized and shall be coordinated with actual equipment components and the selected structural system. Louvers indicated on the drawings are an approximation only and shall be sized and located to meet the specific requirements of the mechanical systems and natural ventilation designed for these buildings. A roof overhang shall be constructed at the main entry to protect facility users entering and exiting the building. A CMU screen wall compatible with the Fort Lewis Installation Design Guide and AT/FP Construction Standards shall be provided around garbage dumpsters, mechanical equipment, electrical transformers and similar equipment and accessory items located outside of buildings.

(2) Exterior Design.

The TEMB, and DESB structures shall be constructed with non-combustible, low-maintenance materials that are compatible with the guidance provided herein. All materials used in common on the three structures shall match in color, texture and pattern. The entire facility shall present a coordinated, monochromatic, military campus appearance.

- (a) TEMB: The exterior design of the TEMB's shall feature walls constructed of two materials/structural systems. The lower portion of walls shall be a concrete masonry unit (CMU) veneer wall system with 200 x 100 x 400 mm integral colored split-faced and ground surface accent units on the exterior, and 200 x 200 x 400 mm structural units on the interior. English unit equivalent CMU may be substituted for metric sizing. Contractor is responsible for all coordination required between measurement systems. Provide silane or siloxane based clear sealers, with solids content of 20% minimum, for all exterior CMU surfaces.

The upper portion of all walls shall be constructed of insulated metal siding panels. Panels shall be a manufactured "sandwich" type panel system with factory finished exterior and interior metal surfaces. All fasteners shall be concealed. Exterior surface shall have a ribbed panel profile. Insulating value of the panel shall be a minimum of 3.34 m² Kw (R-19). Complete paneling with standard corner, base, cap, sill, head, jamb and similar pre-finished flashing and edge trim.

Foundation wall shall be insulated on the exterior face with 1.76 m² Kw (R-10) minimum rigid insulation. Top of insulation shall be located at the bottom of exterior pavements.

The roof shall be a standing seam metal roof applied directly over staggered layers of rigid insulation. All fasteners shall be concealed. The insulation shall in turn be laid on a sealed vapor retarder, which is on a metal deck substrate. The assembly shall have sufficient rigid insulation to provide a 5.28 m² Kw (R-30) value. For the safety of maintenance personnel, fall protection anchor points shall be provided at all roofs.

Anchor points shall be located at the ridge with location and load capacity meeting OSHA requirements for fall protection systems. Sheets A-2 through A-4 provide a conceptual representation of the facility elevations. Roof penetrations shall be avoided. All roof-mounted ventilators shall be low profile, "mushroom" type. Gooseneck style ventilators are prohibited. Prefinished continuous gutter and downspout systems shall be provided.

Where possible, locate all vents and other projections through exterior wall and roof away from high-visibility areas. Plumbing and mechanical vent stacks shall exit the building through the side walls rather than the roof.

Exterior personnel doors and frames shall be hollow metal type, painted and thermally insulated, with full perimeter weather-stripping. All frames shall be solid grouted. Vehicle doors shall be motor operated, coiling steel type with insulated slats. Provide full jamb, sill and hood weather gasketing.

Window frames shall be thermally broken, light bronze anodized aluminum. Glazing to be Low-E insulated laminated glass, clear or light grey tinted. Louvers and frames shall be prefinished galvanized steel.

- (b) DESB: All DESB shall be sided with factory finished metal siding. Complete paneling with standard corner, base, cap, sill, head, jamb and similar pre-finished flashing and edge trim. The roof shall be a structural standing seam metal roof applied directly on the beam/purlin system. Wall, roof and perimeter insulation is not required at the DESB buildings. Doors and louvers shall match the requirements of the TEMB. Exterior walls shall have a continuous 200-mm high concrete curb to provide containment of fluid spills. Entrance doors shall be manually operated, coiling steel type with uninsulated, prefinished steel slats. Vision lights are not required. Door threshold shall be flush with floor slab.

(3) Exterior Finishes:

Structural standing seam metal roofing, metal siding, metal doors, metal trim for siding, roof and openings and miscellaneous roof accessories shall be factory finished in a monochromatic light tan. Window frames shall have a light bronze anodized finish. Integrally colored CMU shall complement roof and wall panel color. Gutters and downspouts shall have factory finish to match roofing and siding. Miscellaneous exterior exposed items such as: gas meters, louvers, and backdraft dampers shall have an approved powder coat factory finish or two-part modified polyurethane finish to match metal siding color. All vents and roof penetrations shall be painted to match the adjacent roof or wall surface. Paint finishes shall be either an approved powder coat, or two part modified polyurethane.

(4) Interior Design:

The facility interior design shall be appropriate for the designed function of the space, utilizing materials with low maintenance qualities for the anticipated use, as well as consideration for health, fire and life safety requirements. Interior partition walls shall be painted CMU except for vault enclosures that are reinforced concrete, or steel stud/gypsum wallboard partitions separating administrative area rooms as indicated on drawings. All exposed corners of CMU shall be constructed with "bullnose" block. Latrine, shower and locker room walls may use glazed block in lieu of painted surfaces. High quality, aesthetically pleasing materials are desirable whenever possible, while keeping the cost of the project within budget. All permanent finishes (vinyl flooring, ceramic tile, plastic laminates, etc.) shall be neutral tones and patterns. These neutral shades can range from

very light (such as off-white relating to the particular color tone) to a mid-range neutral of this same shade. Non-permanent finishes (paint, vinyl wall coverings and similar materials) may be any coloration appropriate to the facility. Use color to add interest and vitality, but do not allow color to dominate the environment. Paint ceilings off-white and do not use spray applied acoustical textured treatment.

- (a) Interior doors and frames, except for vault doors, shall be hollow metal. Doors in rated or secured walls shall be rated and insulated accordingly. Solid grout all frames.
 - (b) Interior glazing shall be clear, laminated glass or fire rated glazing in rated walls. Vision glass in doors in rated or secured walls shall be wire glass.
 - (c) Hardware shall conform to Building Hardware Manufacturers Association (BHMA) standards. Finish shall also conform to BHMA, with satin finish stainless steel (US32D) used for interior and exterior doors. Non-removable pin hinges shall be used in secured areas. Building entry doors and noted interior doors shall have standard key locking system compatible with Best Lock Corporation "BEST" interchangeable 7-pin cores. System shall be expandable.
 - (d) Ceilings shall be 3 meters in height unless other wise noted. Ceiling material shall be acoustical tile, painted gypsum wallboard, painted concrete, or painted steel structure depending on the location. Vaults shall have acoustical tile ceiling adhered to the bottom of the concrete lid.
 - (e) Interior walls shall extend from slab to roof structure, underside of Class A Vault lid, or ceiling grid as indicated on drawings. Walls between the repair bays and administrative area and at the Break/Training/Conference room shall have an STC rating of 45. Noted walls to have one-hour fire rating.
 - (f) All interior floors shall be reinforced concrete. Standard finish is a steel troweled, clear sealed surface. Selected rooms shall have additional finishes as listed in the interior finish schedule on the drawings.
 - (g) Separate bridge cranes shall be provided to service the Repair and Scheduled Maintenance Bays. Height to the bottom of the hook shall be approximately 6,000 mm. Provide adequate clearance above the hook for crane mechanism, bridge beam, mechanical and electrical systems, and roof/ceiling structure.
 - (h) Locate all vents and other projections through exterior wall and roof away from high-visibility areas. All vents and roof penetrations shall be painted to match the roof. Paint finish shall be either an approved powder coat (PVF2), or two part modified polyurethane.
 - (i) All furniture (GFCI) for individual offices shall be freestanding office workstations as opposed to open area workstations.
- (5) Exterior/Interior Signage:
Interior signage shall be compatible with Fort Lewis Installation Design Guides and the Americans with Disabilities Act Accessibility Guidelines. Signs shall provide room names and numbers, with two changeable message strips per sign. Exterior signage with building number shall also be provided. Submit sign samples and number/labeling plan for all rooms in the facility to the CO for approval prior to fabrication.

3.3 STRUCTURAL REQUIREMENTS

3.3.1 Structural Design and construction shall be in accordance with the requirements stated herein, the Geotechnical Report and with the applicable requirements of paragraph " 2. CODES AND STANDARDS." It shall conform to the Army Standard Design for Tactical Equipment Maintenance Facilities with modifications as indicated in paragraph 3.2, ARCHITECTURAL REQUIREMENTS.

3.3.2 Structural Design Submittal: Structural design drawings and computations, signed and sealed by a professional structural engineer registered in the State of Washington, shall be submitted in accordance with Section 00810 Design-Build Contract Procedures, paragraph 2. Preparation of Phase I Project Design Documents.

- (1) Structural Design Criteria: Structural design shall be in accordance with the following criteria as applied to this facility:

Chapter 8 of Technical Instructions, TI 800-01 dated 20 July 1998.

- (2) NOTE: HQUSACE publications are available from the USACE TECHINFO web site at <http://www.hnd.usace.army.mil> - select TECHINFO; Engineer Publications; Instructions; then Technical Instructions.

- (3) Seismic Design Requirements: Seismic design of the subject facility shall be performed in accordance with the requirements of TI 809-04 dated 31 December 1998, using the following design criteria:

- | | |
|--|-----|
| (a) Seismic Use Group: | I |
| (b) Short Period Spectral Acceleration, S_s (%G): | 125 |
| (c) One Second Period Spectral Acceleration, S_1 (%G): | 40 |
| (d) Site Class: | C |

- (4) Wind Loads: Design of the subject facility for wind loads shall be performed in accordance with the requirements of ASCE 7-98, using the following design criteria:

- | | |
|---|-----------------|
| (a) Wind Velocity, 3-sec gust | 40 m/s (90 mph) |
| (b) Exposure Category | C |
| (c) Building Category | IV |
| (d) Maximum Deflection of building under design wind load | $h/400$ |

- (5) Snow Loads: Design of the subject facility for snow loads shall be performed in accordance with the requirements of ASCE 7-98, using the following design criteria:

- | | |
|----------------------------|---------------------------------------|
| (a) Roof Snow Load | 1.5 KN/m^2 (30 psf) + drift |
| (b) Minimum Roof Live Load | 1.5 KN/m^2 (30 psf) |
| (c) Building Category | IV |

- (6) Floor Loads: Dead Load and Live Loads per UFC 3-310-01, except the vault floors shall have a minimum live load of 29 kPa (600psf). Steel reinforced structural concrete slab-on-grade floors shall be of strength and thickness required for the various functional areas of the installation. The floor design for the CSSC, MARC and RSTA/IB shall accommodate radiant in-floor heating requirements. These facilities shall utilize mobile lifts (e.g., ARI-Hetra Heavy Duty Mobile Lift or equal) capable of lifting the heaviest intended vehicle. The floor shall be designed to support the maximum lifting capacity of the mobile lifts in

footprint configurations consistent with the minimum and maximum sized intended vehicles. Signage shall be provided indicating vehicle size and weight restrictions relative to the mobile jacks. Floors shall be functionally and aesthetically suitable for safe operation of the facility, including finish and flatness tolerance.

- (7) Crane Loads: The design for the subject facility shall incorporate dead and live loads induced by a 5 metric ton bridge crane over the maintenance bays and a 10 metric ton bridge crane over the repair bays.
- (8) Foundation Design for frost protection, soil properties, bearing capacity and floor slabs shall be in accordance with the guidance provided in the attached Geotechnical Report (see Appendix B).
- (9) Material Strengths:
 - (a) Concrete: $f'_c=27.6$ MPa (4000 psi) minimum at 28 days, except Vehicle Maintenance/Repair Slab on Grade shall be $f'_c=34.5$ MPa (5000 psi) minimum at 28 days.
 - (b) CMU: $f'_m=10$ MPa (1500 PSI) minimum.
 - (c) Reinforcing Steel: ASTM A615, Grade 60.
 - (d) Welded Wire Fabric: ASTM A185, $F_y = 448$ MPa
 - (e) Structural Steel:
 - 1) Rolled wide flange shapes- ASTM A992, $F_y=345$ Mpa (50KSI)
 - 2) Other rolled shapes and plates - ASTM A36, $F_y=250$ MPa (36 ksi), or ASTM A 572 , $F_y = 345$ MPa (50 ksi)
 - 3) Structural tubing - ASTM A500, $F_y=320$ MPa (46 ksi),
 - 4) Cold formed steel - $F_y=380$ MPa (55 ksi).
 - 5) Open Web Steel Joist: $F_y=350$ Mpa (50ksi)
- (10) Fabrication and Erection of Structural Steel shall be in accordance with the applicable provisions of AISC Code of Standard Practice Sections 6 and 7. The steel fabricator has to be certified under Category I in accordance with AISC Quality Certification Program. Structural framing shall be shop primed in accordance with the fabricators standard system.
- (11) Erection of the structural steel for the facility shall be coordinated with the installation requirements of the lightning protection system. Adequate coordination shall be made to ensure ease of installation of all associated material for the lightning protection system, including the ability to make all necessary connections to structural members.
- (12) Roof Design: Framing members supporting the SSSMR system and their connections shall be designed in accordance with AISC Specifications (LRFD), AISI Manual, or SJI Specifications and Tables, as applicable. The Contractor shall submit the design for review and approval.
- (13) HVAC Maintenance Access: Access shall be provided to overhead Air Handling Units by means of ladders and catwalks. Catwalks shall consist of floor grating and steel framing members supported by the roof rafter beams. Lateral bracing shall be designed to resist seismic loads. The catwalk and its connections shall be designed in accordance with AISC Specifications (LRFD), AISI Manual. Ladders shall be anchored to the wall with safety cage enclosures. The catwalk perimeter shall be designed such that it may be safely

accessed by the ladder. Catwalks, Ladders and Handrails shall conform with the requirements of EM 385-1-1.

3.4 MECHANICAL REQUIREMENTS

3.4.1 Mechanical design and construction shall be in accordance with the applicable requirements of paragraph 2, Codes and Standards, and the following:

(1) Uniform Building Code (UBC), Latest Edition 1997.

International Building Code (IBC-2000)

(2) National Fire Protection Association (NFPA) Latest Edition of the following:

(3) NFPA 10 Portable Fire Extinguishers 1998

(4) NFPA 13 Installation of Sprinkler Systems 1999

(5) NFPA 17A Wet Chemical Extinguishing Systems 1998

(6) NFPA 70 National Electrical Code 1999

(7) NFPA 72 National Fire Alarm Code 1999

(8) NFPA 90A Installation of Air Conditioning and Ventilation Systems 1999

(9) NFPA 90B Installation of Warm Air Heating and AC Systems 1999

(10) NFPA 101 Life Safety Code 2000

(11) NFPA 170 Symbols for Architectural and Engineering Drawings 1999

(12) MIL HDBK 1008C Fire Protection

(13) Underwriters Laboratories (UL)

(14) Factory Mutual Approval Guide

(15) National Electrical Manufacturer's Association

(16) Institute of Electrical and Electronic Engineers

(17) ASHRAE (latest edition) Heating, Refrigeration, Air Conditioning Handbooks of Fundamentals, Applications and Equipment

(18) Chapter 51-13 Washington State Ventilation and Indoor Air Quality Code (1997)

3.4.2 Design Conditions. The outside design temperatures used are based on AFM-88-29 (Engineering Weather Data), dated 1 July 1978. The inside design temperatures are based on MIL-HDBK-1190 (Facility Planning and Design Guide). All design shall comply with federal energy code 10 CFR 425.

(1) Outside Winter

(a) Dry Bulb: -4.4 degrees C. (97 1/2 %) (24 degrees F.)

(b) Dry Bulb: -7.2 degrees C. (99%) (19 degrees F.)

(2) Inside Winter

- (a) Administration Areas, Dry Bulb: 20 degrees C. (68 degrees F.), no humidity requirements.
- (b) Weapons Vault, Dry Bulb: 20 degrees C. (68 degrees F.), 30% humidity maximum.
- (c) Mechanical Room, Dry Bulb: 10 degrees C. (50 degrees F), no humidity requirements.
- (d) Vehicle Bay Area: 10 degrees C (50 degrees F), no humidity requirements.

(3) Outside Summer

- (a) Dry Bulb: 27.8degrees C. (2 1/2%) (82 degrees F.)
- (b) Mean Coincident Wet Bulb: 17.7degrees C. (64degrees F.)
- (c) Daily Range: 16 degrees C. (30 degrees F.)

(4) Inside Summer

- (a) Administration Areas, Dry Bulb: 23.9 degrees C. (75 degrees F.) (through economizer, air conditioning is not authorized).
- (b) Vehicle Bay Area: No upper limit on humidity or temperature requirements.
- (c) Communications Rooms: 40.0 degrees C maximum (104 degrees F).

(5) Degree Days

- (a) Heating: 5339 per year

(6) Elevation: 92 meters (301 feet)

(7) "R" Values (approximate):

- (a) Walls 3.34 m²Kw (R=19)
- (b) Roof 5.25 m²Kw (R =30)

(8) Sound Requirements are as described by ASHRAE Handbook,1999 HVAC Applications, chapter 46:

- (a) Administration Areas, RC 25 maximum
- (b) Mechanical Room, no requirement
- (c) Vehicle Bay Areas, no requirement

3.4.3 Provide detailed heat gain/loss calculations for the administrative portions of MARC, CSSC, RSTA and IB buildings using an hourly analysis and real numbers obtained from these documents and user interviews. A computer simulation shall be performed using a program that is capable of performing an hourly analysis. Results from the program shall be used to size and place equipment in the administrative areas (example: final diffuser locations). Heat gain/loss calculations are not required for the vehicle bays.

3.4.4 The Contractor shall contract Puget Sound Energy Services to design, install and own meter set assemblies and underground natural gas piping to the buildings. The Contractor shall provide the gas piping system from the point of delivery, defined as the outlet of the meter set assembly as provided by Puget Sound Energy Services. For bidding purposes, the Contractor shall assume a price of \$100,000 for services supplied by Puget Sound Energy Services. Any difference in cost of Puget Sound Energy Services will be adjusted in the contract price.

3.4.5 The Contractor shall provide piping (separate from the natural gas piping to be installed by PSE) as indicated on the drawings (see civil drawings). Isolation valves shall be provided to permit manual connection of the propane system to the building natural gas system. The propane piping shall tee into the natural gas piping between the natural gas meter and corresponding building.

3.4.6 All mechanical equipment shall be sited as indicated (no rooftop installations). Mechanical room shall allow for maintenance access. Floor slab shall be sloped toward area floor drains. Pumps and other large floor-mounted equipment shall be mounted on housekeeping pads - 100 mm (4-inch) minimum height. Gauges shall be mounted to be easily readable. A single pressure gauge shall be manifold across each pump inlet, outlet, and inlet to the suction diffuser; ball valves shall be used for isolation on the threaded black A53 steel gauge manifold. Thermometers shall be industrial dial type, not liquid filled "mercury" scale type, and shall be mounted in thermowells with conducting grease. Each closed loop system shall have a replaceable bladder type expansion tank, with the exception of the hot domestic water system, which may use a diaphragm type. Off each air separator shall be an industrial type air vent (iron body stainless steel moving parts, such as B&G 107a). At a minimum, coils and pumps shall be provided with isolation valves. Manual air vents shall be located on the high points of closed loop systems and hose connection drain cocks shall be located at all low points. Heating systems shall have a chemical pot feeder for closed system treatment. Heating water loops shall be provided with temperature reset based on outside air. All coils shall be controlled with valves as indicated in the mechanical schedule. All control valves shall be protected with strainers. Temperature and pressure test plugs shall be installed on the inlet and outlet of all coils, strainers at pumps and boilers.

3.4.7 Pump motors shall be sized to provide non-overloading operation over the entire pump curve.

3.4.8 Ventilation: Ventilation shall be provided in accordance with ASHRAE Ventilation Standard 62 -- not less than 9.4 L/s (20 cfm) per person for general occupancy areas for acceptable indoor air quality. All ductwork shall be galvanized steel, constructed in accordance with SMACNA Low Pressure Duct Standards. It is desirable that any grates, louvers, or supply/return vents in occupied areas shall be either an approved powder coat finish or two-part polyurethane finish to match surrounding color.

3.4.9 Building Cooling System: Air conditioning is not authorized. Administrative area air handling units shall be provided with economizer cycles.

3.4.10 Administrative Area Heating System: The heating system shall consist of gas fired boilers. The MARC and CSSC buildings shall contain two hot water boilers. The RSTA and IB buildings shall each contain a single hot water boiler. The MARC building administrative area contains two constant volume air handling units. The smaller air handling unit serves the conference room that is occupied intermittently. Occupied mode of the conference room is determined through status of the light switch instead of schedule. The larger air handling unit serves the remaining administrative portions of the building. The CSSC building administrative area also contains two air handling units. Each unit serves a separate zone. The RSTA and IB building administrative areas each contain a single constant volume air handling unit. A preliminary layout of these systems has been provided. The Contractor shall complete the design. All air handling units in the administrative areas shall be provided with economizer cycles. The air handling units shall consist of combination mixing box/filter, medium size access, hot water coil, backward inclined or air-foil design fan (as indicated) and a discharge module. All equipment and components shall be direct digital control.

3.4.11 Weapons Vaults: Vaults shall be provided with forced air hot water unit heaters. A local thermostat shall be provided for each unit heater. The vaults shall be provided with adsorption dehumidifiers to maintain a maximum relative humidity level of 30 percent. Exhaust fans located within the vaults shall be interlocked to operate when the vault lights are energized.

3.4.12 Mechanical Rooms and Fluid Storage Rooms Heating Requirements: Forced Air hot water unit heaters shall be installed to prevent freezing.

3.4.13 Communications Rooms Cooling: Maximum heat output of equipment is 1.8 kW; therefore, a 275 liters/second fan shall be provided to limit the maximum temperature to 6 degrees C above ambient.

3.4.14 Vehicle Bay Area:

- (1) The primary heating system for the MARC, CSSC, RSTA AND IB vehicle bay areas is an in-floor radiant heat system. The in-floor radiant heat system consists of 20 mm diameter tubes (beneath the concrete in a layer of sand) with a spacing of 250 mm. Tubing circuits are arranged in a counterflow spiral pattern (i.e. supply and return lines are routed next to each other) to minimize temperature variations across the concrete slab. A detailed description of the system is shown on the Vehicle Bay HVAC Plan drawing and Sequence of Operation. A secondary hydronic loop, with a separate reset schedule, supplies hot water to the in-floor radiant tubing system.
- (2) A vehicle exhaust system shall be provided for each bay. Each vehicle exhaust connection and associated 127 mm diameter flexible hose shall be provided with a separate exhaust fan that is manually energized. The flexible hose shall either be overhead hanging or on a drum roller.
- (3) In the event carbon monoxide levels exceed 35 ppm or carbon dioxide levels exceed 5,000 ppm, an air handling unit shall provide 100 percent outside air to dilute the concentration of contaminants. Furthermore, a roof mounted exhaust fan shall energize to exhaust at a rate equivalent to outside air being provided. A detailed description of the system is shown on the Vehicle Bay HVAC Plan drawing and Sequence of Operation. Both, the MARC and CSSC buildings, contain two ventilating air handling units each. Both, the RSTA and IB buildings, contain a single ventilating air handling unit each.

3.4.15 HVAC Controls: Direct digital controls (DDC) shall be provided for the heating, ventilating and air conditioning systems. Unit heaters, convectors, fin tube, and utility room ventilation may be controlled through local thermostats. The heating water loop shall be reset in response to outdoor air temperature. Direct digital controllers shall be provided with all required hardware to permit future connections with fiber optic cable. A future base energy monitoring control system (EMCS) shall monitor all points indicated below and any values calculated by the building DDC systems. Sequences of control shall be provided in the O&M manual. Testing, adjusting, and balancing of the systems shall be coordinated with the control system installation. All HVAC control components shall be verified to be properly installed and operating as specified before proceeding with testing, adjusting, and balancing. HVAC commissioning procedures shall be used to verify the proper installation and functioning of the equipment. Contractor shall have the Mechanical Design Engineer of Record present on-site for all commissioning. At a minimum, the following points shall be monitored in addition to all other points required for control:

- (1) building loop heating water supply and return temperatures
- (2) boiler supply and return temperatures
- (3) in-floor radiant heat supply and return temperatures

- (4) all boiler controls
- (5) air handling unit return and supply air temperatures
- (6) filter status via differential pressure switch
- (7) zone temperature setpoints
- (8) sensor readings including but not limited to temperature, CO concentration, CO₂ concentration and pressures
- (9) control valve positions (excluding unit heater control valves)
- (10) pump status via differential pressure switch
- (11) fan status via current switch
- (12) dampers and position

3.4.16 Fluid Supply and Waste/Recycle

The MARC and CSSC shall be provided with bulk fluid supply and waste/recycle. Each building shall be supplied with an 1,850 L supply motor oil tank, 1,850 L supply gear oil tank, 1,850 L supply anti-freeze tank, 1,850 L supply Dextron transmission tank and 1,850 L supply hydraulic oil tank. Supply tanks shall be provided with air-operated diaphragm pumps, piping and controls to supply the fluid to hose reels located between vehicle bays (i.e. 10 hose reels per building per fluid). Hoses shall be supplied with pre-set control handles (nozzles) that have a range of 1.0 to 15 quarts (English units). Each building shall also be provided with (2) 1,850 L waste oil tanks (used for motor oil and gear oil), a 925 L waste anti-freeze tank, a 925 L waste Dextron transmission fluid tank and a 925 L hydraulic waste tank. Tanks shall be provided with overflow protection, fill connection (coordinate with fluid supplier), waste removal connections (coordinate with waste/recycle supplier), waste oil funnel (waste tanks only), float gauge, vents, interstitial tank monitoring and any other appurtenances required by applicable federal, state and local laws and regulations. Anti-freeze tanks shall be manufactured of polyurethane. All tanks shall be UL listed and of double wall construction.

3.4.17 Plumbing:

- (1) Water piping and fittings shall be as specified in 00890-15400. Water supply piping shall not be buried under concrete floors, except for water service piping routed from the underground water distribution pipe to a point 300mm above the Mechanical Room floor.
- (2) Soil, waste and vent piping shall be as specified in 00890-15400. Hubless cast-iron soil pipe shall not be installed under concrete floor slabs. Floor drains shall feature trap primers. Provide water meter.
- (3) Plumbing materials, installation, backflow prevention, and drainage shall meet the latest National Standard Plumbing Code requirements.
- (4) Domestic hot water shall be provided by natural gas-fired hot water heaters located in the mechanical rooms. Hot water shall not exceed 120 degrees F. A hot water circulating pump shall be installed on the system that circulates under all operating conditions.
- (5) National Standard Plumbing Code (1996): Fixtures for use by the physically handicapped shall be in accordance with Council of American Building Officials CABO A117.1,

Accessible and Usable Buildings and Facilities (1992). All fixtures shall be as specified in 00890-15400 and white.

- (6) The common area of each building shall contain one refrigerated drinking fountain.
- (7) Men's washroom in the MARC building shall have one accessible water closet, one urinal, one lavatory, one shower stall and one floor drain. The woman's washroom in the MARC building shall have one accessible water closet, one lavatory, one shower stall and one floor drain.
- (8) Men's washroom in the CSSC building shall have two water closets (one accessible), two urinals, two lavatories, two shower stalls and one floor drain. The woman's washroom in the CSSC building shall have one accessible water closet, one lavatory, one shower stall and one floor drain.
- (9) Men's washroom in the RSTA and IB buildings shall each have one accessible water closet, one urinal, one lavatory and one floor drain. The woman's washroom in the RSTA and IB buildings shall each have one accessible water closet, one lavatory and one floor drain.
- (10) The Janitor closet in each building shall have all mounted fixtures with hose bib, vacuum breaker, floor mounted type service sink and a floor drain. The break room in each building shall contain one kitchen sink, and one refrigerator with built-in ice maker.
- (11) Mechanical rooms shall have floor drains ample enough to eliminate indirect drain piping routed across the floor.
- (12) Weapons storage vaults and one maintenance bay per building shall have floor drains.
- (13) Hose bibs shall be provided between each set of roll-up doors in the vehicle bays.

<u>Symbol</u>	<u>Fixture</u>
WC-1	Water Closet
WC-2	Water Closet (Accessible)
UR-1	Urinal
LV-1	Lavatory
SK-1	Kitchen Sink
WC-1	Electric Water Cooler (Handicapped)
SK-2	Service Sink
HB-1	Hose Bibb
WH-1	Wall Hydrant
FS-1	Floor Sink With Trap Primer
FD-1	Floor Drain With Trap Primer

3.4.18 Fire Protection/Detection:

- (1) Fire protection system shall be based on ETL 93-5, NFPA, and Military handbook 1008C. A wet system is required for the MARC, CSSC, RSTA and IB buildings.
- (2) Services and Qualifications of Fire Protection Engineers are as follows: The services and review of a qualified fire protection engineer are required. A qualified fire protection

engineer shall be an integral part of the design team, and shall be involved in every aspect of the design as it relates to fire protection. This includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, water supply analysis, and a multi-discipline review of the entire project. For the purpose of meeting this requirement, a qualified fire protection engineer is defined as an individual meeting one of the following conditions:

- (a) A registered professional engineer (PE) who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination.
- (b) A registered PE in related engineering discipline with a minimum of 5 years' experience dedicated to fire protection engineering and has attained state certification for fire protection engineering.
- (c) Installation Requirements: Installation of fire alarm detection systems, fire protection suppression systems, and any of the components, the technician installing this equipment must be licensed in the State of Washington and hold the proper endorsement for such installation. The license and endorsements are as follows:

SAF = Fire Alarms
SEF = Extinguishing Systems
SAFS = Special Agent Fire Suppression System
- (d) A licensed journeyman electrician can install fire alarm systems and its components if the above endorsements are stamped on their license and factory trained, or NICET II certified and factory trained in the installation of the fire alarm devices being installed. The installer must be NICET II certified and licensed with the State of Washington licensing program to inspect test and certify the operational condition of the system. All licensees, endorsements and NICET certifications must be presented to the Contracting Officers and the fire prevention officers, the company name and personnel name(s) installing the system before work is to begin.
- (e) All fire alarms, fire suppression, and special agent systems must be installed IAW the appropriate NFPA Code 13 13A, 17, 17A, 24, 25, 72, 101 and any other code reference mentioned in contract specifications, manufacturer's recommendations and construction drawings. Current licensees, endorsements, and NICET certification must be on file.

3.4.19 Testing and Balancing:

- (1) General: The facility shall be essentially complete prior to testing. Doors and windows surrounding each area to be balanced shall be closed during testing and balancing operations. Air systems shall be complete and operable. Exhaust fans shall be operational. Hydronic systems shall be complete and operable with balancing valves, coils, pumps, piping and control components in place. If a system cannot be adjusted to meet the design requirements, the Contractor shall promptly notify the Contractor and copy the Contracting Officer in writing. The Contractor shall correct the system and have the TAB Contractor test again and report in writing to the Contractor and the Contracting Officer. Each system shall be adjusted until all flow quantities are within plus 10 percent and minus zero percent. Air balancers shall be nationally certified. Representatives from the design firm(s) shall be present for commissioning.
- (2) General Balancing Methods: Throttling losses shall be limited. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjusting devices

including valves, splitters, and dampers shall be permanently marked by the testing and balancing engineer so that adjustment can be restored if disturbed at any time. Provide auxiliary (simulated) loads if required for fill testing.

- (3) Acoustics: After the systems are properly tested, adjusted and balanced, sound levels shall be checked in accordance with the applicable provisions of AABC MN-1. Octave-band analysis and noise-criteria curve data shall be recorded on forms shown in AABC MN-1. All occupied areas shall be verified to be within sound levels acceptable within comparable commercial facilities and stated STC levels. Any areas not meeting the requirements shall be clearly indicated on the form and an explanation of all discrepancies shall be provided in test report.

3.4.20 Commissioning Team and Checklists

- (1) General: The Contractor shall designate team members to participate in the pre-commissioning checks and the functional performance testing specified herein. In addition, the Government will be representative of the Contracting Officer, and the Using Agency. The team members shall be as follows:

<u>Designation</u>	<u>Function</u>
Q	Contractor's Chief Quality Control Representative
M	Contractor's Mechanical Representative
E	Contractor's Electrical Representative
T	Contractor's Testing, Adjusting, and Balancing Representative
C	Contractor's Controls Representative
D	Contractor's Mechanical Designer
O	Contractor's Officer's Representative
U	Using Agency's Representative

- (2) The commissioning team shall complete each checklist shown in Specification 15995. Acceptance by each commissioning team member of each pre-commissioning checklist item shall be indicated by initials and date unless an "X" is shown indicating that participation by the individual is not required. Acceptance by each commissioning team member of each functional performance test checklist shall be indicated by signature and date.
- (a) Pre-Commissioning Checks: Pre-commissioning checks shall be performed for the items indicated on the checklists in Specification 15995. Deficiencies discovered during these checks shall be corrected and retest in accordance with the applicable contract requirements
- (b) Functional Performance Tests: Functional performance tests shall be performed for the items on the checklists in Specification 15995. Functional performance tests shall begin only after all pre-commissioning checks have been successfully completed. Tests shall prove all modes of the sequences of operation, and shall verify all other relevant contract requirements. Tests shall begin with equipment or components and shall progress through subsystems to complete systems. Upon failure of any functional performance test checklist item, the Contractor shall correct all deficiencies in accordance with the applicable contract requirements. The checklist shall then be repeated until it has been completed with no errors.

3.5. ELECTRICAL DESIGN REQUIREMENTS

3.5.1 Design criteria

The design shall be based on, but not limited to the following design criteria:

ANSI C2-1997	National Electrical Safety Code
IES	Lighting Handbook
MIL HDBK 1008C	Fire Protection for Facilities
NFPA 70	1999 National Electric Code
NFPA 72	1999 National Fire Alarm Code
NFPA 101	2000 Life Safety Code
NFPA 780	Lightning Protection Code
TM 5-811-1	Electric Power Supply and Distribution
TM 5-811-2	Electrical Design, Interior Electrical System
TM 5-811-3	Electrical Design Lightning and Static Electricity Protection
Standard Drawing No. 40-06-04 Lighting Fixtures, U. S. Army Corps of Engineers	

3.5.2 Equipment shall conform to the requirements of the National Electrical Manufacturers Association, Underwriters Laboratories, Inc., Institute of Electrical and Electronic Engineers, and the American National Standards Institute.

3.5.3 Underground lines/duct shall be installed in accordance with the guidance provided herein and in outline specification 02316 "Excavation, Filling and Backfilling for Utility Systems" of Section 00890 Outline Specifications.

3.5.4 Electrical Service

- (1) General. Power distribution on the base is 13,800 volts, 3 phase, 3 wire. Primary electrical service shall be provided by tapping the existing O/H lines per the Electrical Site Plan. The new high voltage conductors shall be routed down the pole and continue underground to new pad mounted, tamper-proof compartmental transformers as shown on the Electrical Site Plan. The Electrical Site Plans are conceptual and therefore the Contractor is encouraged to propose a different layout as long as it meets the requirements of this Request for Proposal.
- (2) The following criteria pertains to the general exterior service design requirements:
 - (a) Secondary feeders from transformer to facility shall be copper, 600V type USE for service entrance cable, and installed in underground concrete encased duct when in paved areas. Direct buried Schedule 40 PVC ductbank is acceptable for non-paved areas. Rigid galvanized steel encased in concrete shall be used under building footings.
 - (b) All underground High Voltage duct banks shall be concrete encased and shall include one spare conduit. The duct banks for the service lateral and each type of communications shall include one spare conduit. Provide conduit separation per ANSI C2.
 - (c) Provide all spare conduits and inner-ducts with pull cord.

- (d) For all 60 Hz power circuits (13.8 kV and 120/208 V), provide 1 spare conduit of equal size for each conduit installed.
 - (e) All high voltage (13.8kV) taps/connections are to be made on above ground sectionalizers, or loop-fed pad-mount transformers with appropriate bushings. No high voltage taps shall be made in handholes or manholes.
 - (f) Electrical system grounding and lightning protection for the new facilities shall be provided in accordance with the requirements of NEC article 250, ETL 90-6, and NFPA 780. Grounding shall consist of a counterpoise grid system composed of copper clad steel ground rods interconnected by stranded bare 1/0 copper wire. Lightning protection shall include equipotential structural bonds, with the metal roof grounded and bonded.
 - (g) The high voltage cable shall be 15 kV cable, ethylene propylene rubber type insulation (133% level), in accordance with NEMA WC-8.
 - (h) Neutral conductors, cable shields, and all other noncurrent-carrying metallic parts of equipment shall be grounded. Ground resistance of not greater than 25 ohms shall be provided.
 - (i) Label all cables, where they come from and where they go, with embossed tags.
 - (j) All Primary and HV connections shall be loadbreak type rated 200A.
 - (k) Pad mounted transformers shall be 3 phase, delta to wye with grounded neutral, dead front, loop feed with "T-blade" configuration, oil immersed type, loadbreak group operated switch, surge arresters, and dry-well-mounted current limiting fuses. Service transformer shall have two 2 ½ percent taps above and below rated voltage. Provide low impedance transformers where short circuit currents permit. Transformers shall be equipped with a kill switch on the primary side of the transformers. Provide bollards around each transformer for protection from vehicles. Transformers shall be sized to serve the loads indicated and allow for 20% growth.
 - (l) All cabinets shall be provided with padlock hasps.
 - (m) Aluminum shall not be used in contact with earth or concrete.
 - (n) Duct lines shall be concrete encased under all pavement. A brightly colored plastic tape, not less than 75 mm in width and suitably inscribed with a continuous metallic backing and corrosion resistant metallic foil core to permit easy location of the duct line, shall be placed approximately 300 mm below finished grade.
 - (o) Control wiring and communications wiring shall not share the same conduits, raceways, or enclosures as electrical power wires (120 Volts nominal or larger).
- (3) Motors. All motors shall be high efficiency types and use derated values for supply voltages, i.e., for a 480V service use a 460V rated motor; for 208V service provide a 200V motor. In addition, all motors shall have a safety disconnect switch mounted in a clearly labeled and accessible location. Motors over 7.46 KW shall have under-voltage, phase loss, and phase reversal protection. For induction motors 7.46 KW and larger provide power factor correction capacitors to correct power factor to .90.

3.5.5 Lighting

- (1) General. Lighting levels shall be designed in accordance with Illumination Engineering Society (IES) standards except as noted herein. All lamp fixtures shall be energy efficient as per Energy Star requirements, but lamp life shall be specified.
 - (a) Interior Lighting. Areas with suspended acoustical ceiling tiles have lay-in fluorescent fixtures compatible with the ceiling. Open ceiling rooms use suspended, open industrial fluorescent fixtures. Luminaries shall be standard commercial type and conform to the Underwriters Laboratories, Incorporated, Standard for Electric Lighting Fixtures. Energy saving cool-white fluorescent lamps rated 32 watts, 2850 lumens and electronic ballasts are specified. Compact fluorescent lamps shall be used in place of incandescent lamps in small rooms. Switching schemes shall allow fixtures to be turned off when not in use.
 - (b) Luminaries for the scheduled maintenance and repair bays shall be installed 8M above finished floor which is the same height as the radiant heaters. The lamps in these bays shall be metal halide.
- (2) Lighting systems shall be designed to meet the following illumination levels:

GENERAL ILLUMINATION LEVELS TABLE	
Area	Lux (foot-candles)
Interior	
Maintenance Repair Bays	807 (75.0)
Electrical/Mechanical Rooms	323 (30.0)
Toilets	215 (20.0)
Entry	323 (30.0)
Corridors	323 (30.0)
Administration Offices	538 (50.0)
General Item Repair Room	538 (50.0)
Janitor	161 (15.0)
Tool Room	323 (30.0)
Weapons Storage	323 (30.0)
Deployment Storage	215 (20.0)
Exterior	
POV Parking	6 (0.5)
Military Parking	6 (0.5)

- (3) Wiring shall consist of insulated copper conductors installed in rigid metallic conduit or metallic (EMT) tubing systems. Exposed conduit is permitted only in unfinished areas. Provide a green jacketed ground wire in all conduits. Conduit above the floor up to 3 meters height and exposed shall be intermediate metal or rigid steel if subject to damage. Conductor insulation shall be type TW (60 degrees C) for conductors smaller than No. 1/0

AWG and THW (75 degrees C) for conductors No. 1/0 AWG and larger; except other acceptable NFPA 70 types of insulated conductors of equivalent ampacity may be substituted.

- (4) Exit and Emergency Lighting. Exit lights (LED battery type with red letters) and emergency lights shall be provided as required by NFPA 101, Life Safety Code and ADA/UFAS 4.28.3. Allow for continued functioning for a minimum period of 90 minutes. Wall mounted battery back-up type fixtures are not acceptable. Exits shall be marked by readily visible signs in all cases where the exit or way to reach it is not readily apparent to the occupants. Signs shall be located not more than 3.5 meters from exits, internally illuminated, and the LED type consuming less than 7 watts per side. Self luminous type exit signs shall not be installed. Egress lighting to be provided at 11 lux in accordance with NFPA 101. Egress lighting shall be accomplished by selective illumination of normal lighting fixtures. Power for egress and exit lighting shall be provided by single source inverters, installed in electrical rooms. Egress and exit lights shall be circuit breaker switched from electrical rooms
- (5) Exterior Lighting. Exterior lighting system shall consist of pole mounted high pressure sodium fixtures and shall be provided for Military Vehicle Parking and Privately Owned Vehicle Parking lots. Wall pack HPS area lighting shall be used for exterior building illumination and for outside utility area. Recessed HPS down lights shall be used at building covered entrances. Power for the parking area lighting shall be from within each building. An individual photocell per parking area, that is accessible with an 2.4 M step ladder, and a lighting contactor located inside buildings shall control parking area lighting.

3.5.6 Building Power

- (1) All branch circuit panelboards that are not in the same room as the MDP shall have main breakers. Branch circuit panelboards shall be bolt-on circuit breaker type and shall have copper bus bars. Minimum size overcurrent devices for branch circuits shall be 20 amps. Ensure proper coordination and withstand ratings for all overcurrent protection devices. Phase loading shall be balanced to within 10% at all panelboards. All panelboards shall be provided with factory-mounted TVSS's. TVSS's shall comply with UL 1449 2nd Edition. In addition to these panelboards, a common branch circuit panelboard supplying critical loads, coordinated by the base, shall also be located in the electrical room.
- (2) All distribution equipment within the buildings shall be sized to allow 20% growth.
- (3) In the administrative portion of the vehicle maintenance buildings one duplex 110 volt/20 amp receptacle shall be provided every 3000 mm (12') along walls, within 1800 mm (6') of each door and for any wall space 600 mm (2') or more in width. Receptacles shall be coordinated with the furniture locations. Receptacles shall be mounted 450 mm (18") above finished floor, and switches shall be mounted 1050 mm (42") above finished floor. Ground fault protection shall be provided where required by codes. Provide receptacles for water coolers.
- (4) The DESB buildings shall be provided with two 120V duplex receptacles per segregated section. They should be installed on the same wall as the roll-up door.
- (5) In the Administrative portions of each vehicle maintenance building each systems furniture workstation shall be pre-wired to a dedicated outlet. The pre-wired workstation requires a dedicated 15-amp circuit. Specific location needs to be coordinated between the designer, workstation manufacturer and end user during design.

- (6) Wiring, conduits, switches, disconnects and controllers shall be provided for all equipment requiring electrical power.
- (7) Bathrooms. Provide a duplex GFI convenience outlet at each vanity.
- (8) A separate electrical room shall be provided in the buildings as shown on the Architectural plans. The electrical rooms shall be accessed from the exterior of the building. Adequate ventilation shall be provided.
- (9) Hazardous Areas - Hazardous areas are defined in accordance with Articles 500 and 511 of NFPA 70. Electrical equipment and installation methods in hazardous locations shall be in accordance with Article 501 of NFPA 70. The pit areas of the Maintenance Bays shall be Class I, Division I, and the rest of the Maintenance Bay areas shall be Class I, Division II up to .45 meter (18") AFF. The office complex is positive pressurized with respect to the maintenance bays and is not classified as hazardous.

3.5.7 Telecommunications Systems

- (1) A communications room is required for the 4 vehicle maintenance facilities (CSSC, MARC, RSTA AND IB). This room serves as the entrance facility for all incoming communications ducts and as the main location for communications equipment. Provide minimum two 20 amp dedicated circuits. Provide plywood backboard, minimum size 1200 mm by 2400 mm, on all walls. The room shall also have normal receptacles on all walls in accordance with the NEC and/or local codes. Provide a single point ground for all communications equipment. Provide a 150mm x 600mm copper ground plate installed 300 mm above finished floor. Ground plate with #1 cu wire or larger. The resistance to ground must not exceed 25 ohms.
- (2) Contractor shall provide communications raceway from each communications room to every communications outlet. Raceway may be conduit or a combination of cable tray and conduit. A voice/data outlet shall be provided for every 7.43 square meters (80 SF) in administration and office space. Locations shall be coordinated for communications outlets to be placed near power receptacles. Outlets for wall phones shall be provided in electrical and mechanical rooms, tool room, tool issue, etc. A data outlet shall be provided in the mechanical room. One voice/data outlet shall be provided in the Break Training Center (BTC) room. See the Standard Fort Lewis Installation Details, D1 through D4 attached at the end of section 00860 for details of components and configuration.
- (3) Exterior Communications. Contractor shall provide the exterior communications duct system all the telephone cable and fiber optic cables, including splices and terminations.
- (4) Security. A two level Intrusion Detection System shall be provided for the weapon and ComSec Vaults. The first level consists of balanced magnetic switches at doors; the second level consists of volumetric passive infrared motion detectors. Key pad and control panels for the system are located within each secure area. Interior wiring from the system's equipment is routed and connected to the telephone backboard for connection to the Military Police via the telephone system. The IDS shall be an integrated commercial Detection System (ICIDS) and fully compatible with the existing base ICIDS system. The control unit shall be a Remote Control Unit (RTU) 190, manufactured by Monitor Dynamics Incorporated (MDI), a subsidiary of Ultrak. Ask for ICIDS RTU 190 for use with existing OS2 SafeNet system. The RTUs talk to a PPU which can handle up to 64 RTUs over fiber – 2 strands per RTU. Or, the RTUs can be daisy-chained over 2-pair copper RS 485. The Contractor shall coordinate with Chief of Physical Security, Tim Bradon, 253-967-9283, and Lysander Bone, Lockheed Martin, 256-880-5537, for design, estimates, and activation. Note: AR 190-11, 3-6, h, (3), Intrusion Detection Systems, says "Civilian

employees whose duties involve the design, operation or maintenance of IDS require completion of a favorable National Agency Check with written inquiries (NCAI) prior to appointment to such non-critical-sensitive positions. Civilian contractor employees must possess a minimum security clearance of CONFIDENTIAL, granted in accordance with AR 380-67, paragraph 3-400.

- (5) Public Address System. A public address system with zoning capabilities and direct access microphones shall be provided for the scheduled maintenance and repair bays.

3.6 FIRE DETECTION REQUIREMENTS

3.6.1 Design Reference Documents:

International Building Code (IBC-2000).

National Fire Protection Association (NFPA) Latest Edition of the following:

NFPA 70	National Electrical Code 1999
NFPA 72	National Fire Alarm Code 1999
NFPA 90A	Installation of Air Conditioning and Ventilation Systems 1999
NFPA 90B	Installation of Warm Air Heating and AC Systems 1999
NFPA 101	Life Safety Code 2000
NFPA 170	Symbols for Architectural and Engineering Drawings 1999
MIL HDBK 1008C	Fire Protection

Laboratory Publications:

Underwriters Laboratories (UL)

Factory Mutual Approval Guide

National Electrical Manufacturer's Association

Institute of Electrical and Electronic Engineers

American National Standards Institute

3.6.2 Design Requirements

Design requirements shall be Class A fire protection system. A Fire Protection Engineer licensed in the United States of America shall design the fire sprinkling and fire alarm system. The hydraulic calculations and complete fire protection design shall be submitted for review prior to installation.

- (1) A fire detection and alarm system shall be provided in compliance with NFPA 72. The system shall be the addressable device type. Detection shall be provided for all areas, including above suspended ceilings. Detection and alarm shall be designed with the requirement that the buildings will be sprinkled in accordance with MIL-HDBK-1008C.
- (2) Detection in the facility is by photoelectric smoke detectors , combination fixed temperature/rate-of-rise heat detectors and manual pull stations. A radio transmitter for alarm/trouble transmission shall be provided for each facility. The transmitter shall be fully compatible with the existing King Fischer receiver-processor used on Fort Lewis. (King-Fischer Co., 2350 Foster Ave., Wheeling IL, 60090, phone (847) 398-7100

(www.kfco.com) or G.H. Harlow Co., Inc, 15757 SW 74th Ave., Suite 550, Tigard, OR 97224, phone (503) 620-9547).

- (3) The transmitter system shall include the transmitter, associated interface, antenna, antenna discharge unit, antenna mast, all interconnections, wiring, conduit, grounds and weatherproof building penetrations. All equipment shall be installed in accordance with manufacturer's instructions.
- (4) The transmitter shall transmit troubles and alarms at the frequency of 138.925MHz. Transmitter shall be solid state and contain an integral power supply, charger and sealed batteries. The batteries shall be capable of sustaining operation in all modes for not less than 24 hours.
- (5) The transmitter shall transmit a trouble signal in lieu of a test signal whenever the transmitter is in a trouble condition.
- (6) The interface shall consist of all equipment necessary to connect the transmitter to the fire alarm control panel so fire alarms and one common trouble signal will be appropriately transmitted.
- (7) The transmitter shall have its own antenna. Antenna shall be of suitable strength to withstand ice and 201 km/hr wind load. Antenna shall be stainless steel, 5/8 wavelength, omni-directional, vertically polarized and with radial ground plane elements. The ground plane elements shall be no less than 600 mm from grounded metal surfaces. The antenna mast, mounting brackets, and bracing shall be of a configuration appropriate to the structure on which the antenna is mounted. The antenna lead shall be provided in galvanized rigid steel conduit.
- (8) Pull stations shall be mounted in dry locations where temperatures do not fall below 4.5 degrees Celsius. Use plastic main bodies, and install a rubber gasket between the mounting metal plate and the box.
- (9) Fire alarm panels, transmitters, IDS & UPS units, and other sensitive electrical or electronic equipment shall be installed in dedicated electrical equipment rooms, readily accessible to maintenance personnel, independent of building occupants. These rooms shall be accessible from exterior of facility, separated from mechanical spaces or other areas subject to excessive temperature and moisture.

END OF SECTION

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APPENDIX B

CONCEPTUAL DRAWINGS

(See separately attached conceptual drawings.)

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INDEX OF DRAWINGS

FY02 VEHICLE MAINTENANCE FACILITY FT. LEWIS, WA PN 54068 & 54113

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46	E-11	Detail II	A	3 APR 2002
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REVISIONS TO DRAWINGS BY NOTATION

Drawing, Sheet C-2: Delete propane line. Delete “Existing Propane Line” and “Point of Connection to Existing Line.”

Drawing, Sheet C-5: Add Note 5, to read, “Components within a fenced area define the scope of work for the respective Bid Item.”

Drawing, Sheet C-6: Add Note 5, to read, “Components within a fenced area define the scope of work for the respective Bid Item.”

Drawing, Sheet C-7: Delete propane line. Delete “Existing Propane Line” and “Point of Connection to Existing Line.”

Drawing, Sheet C-8: Show 200mm force main (FM) to extend from Plate C-7 matchline, to terminate at sanitary lift station, at the outlet of oil/water separator.

Drawing, Sheet A-8: In Detail at Eave, change Rigid Insulation to R-30, min.

Drawing, Sheet A-9: In CMU Wall Section, delete “(R-7)” from rigid insulation callout.

STANDARD DETAILS BOUND IN THE SPECIFICATIONS

DRAWING NUMBER	SHEET NUMBER	TITLE	DATE
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SECTION 01501 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1 & 2	U.S. Air Force Project Construction Sign	84JUN20
1	Hard Hat Sign	10SEP90

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